EPA Question #1: Discharge Volumes

Vessel Discharge Volume Estimates

Introduction

Shell Exploration & Production Company – Alaska Venture (Shell) has prepared this response to EPA's Question #1 on the content of Shell's pr ior comment on vessel discharge m onitoring requirements in Section II. A(2) of the draft NPDES general permit for oil and gas geotechnical surveys (GGP) in the Alaska Arctic Beaufort and Chukchi Seas (AKG-28-4300). What is provided herein is believed to be a good representation of these situations at the current time, but they may in the future be subject to some alteration owing to information/experiences obtained in the field and/or Shell's future developmental plans.

Shell's response to EPA's question on vessel discharges and volume as sumptions for a range of geotechnical vessels that could be used centers on the initial toxicity screening, fecal coliform sampling, and other additional sampling requirements specified under each specific "vessel discharge" stream in the draft GGP which are above and beyond that which EPA requires for vessels operating as a mode of transportation under EPA's Vessel General Permit (VGP). A geotechnical survey vessel operating in the offshore is positioned over the site of a geotechnical survey via dynamic positioning (DP) for a short duration of time during which a borehole is sampled. During th e time the vessel is "on DP" it continues to operate as a marine mode of transportation. Due to the short duration of time necessary for the sampling of a borehole from the vessel there is a correspondingly low likelihood of any ecologically-significant potential impact from the vessel-specific discharges. The types of vessels used for offshore geotechnical surveys frequently operate "on DP" in the offshore regardless of the activity or purpose being performed and are not restricted from discharging the specific vessel discharge streams defined in the draft GGP, or the restrictions are regulated by other means such as MARPOL (International Convention for the Prevention of Pollution from Ships) , the US Coast Guard , or EPA's VGP. Even for vessels that do not operate on DP, such as a liftboat, (described in a forthcoming document) the duration of time the vessel is on-site to sample remains as limited as a geotechnical vessel "on DP" sampling a comparable depth borehole offshore. Consequently, Shell believe s the monitoring requirements for the vessel discharge streams in the dra ft GGP from vessels conducting a geotechnical survey whether "on DP" or from a liftboat should be comparable to the VGP.

In Shell's initial application that was submitted to EPA January 30, 2013, it is acknowledged that some volume estimates were provided for "vessel" discharges and disch arges associated with geotechnical surveys based on maximum pump capacity not on measured volume discharges . However, as described below, estimating the volumes associated with the "vessel" discharges is very difficult as vessels aren't currently required, nor configured to monitor this type of information (with the exception of bilge treated through an oil water separator) . There are no reasonably feasible method s currently in place to accurately measure the volumes associated with "vessel" discharges. It would be extremely expensive to install monitoring equipment on a range of vessels that could be used to perform these activities – with no corresponding benefit to the assessment of environmental impact of these ephemeral discharges . Monitoring of volumes associated with vessel discharges is not required by EPA's VGP and Shell contends should similarly not be a part of any GGP for geotechnical survey vessels while performing short-duration site activities . It is our recommendation based on the inform ation summarized below and the work that EPA has recently completed to authorize these same discharge

streams from a much broader range of vessels (all vessels greater than 79 feet operating in US Waters) in the VGP, that EPA does not have the requisite ju stification to regulate geotechnical surveys vessel discharges in the GGP more frequently than, or in fact any differently, than, is already required by a VGP.

Non-Contact Cooling Water

Non-contact cooling water discharge varies greatly from vessel to vessel depending on the size of the propulsion and power generation plant and where the vessel is designed to primarily operate. The cooling systems for a ship are designed by shore side design engineers and naval architects to be properly sized to adequately cool shipboard equipment.

Possible ranges of volumetric flow - Non-contact cooling water flow varies from zero discharge in a closed loop system that utilizes keel coolers (normally only found on smaller vessels) to the sea water flow required to provide enough cooling for a specific plant.

Non-contact cooling water is not typically monitored for the following reasons:

A). There is no ecologically-significant impact from non-contact cooling water as the non-contact cooling water is only a few degrees warmer than ambient seawater temperature. In addition, by definition, non-contact cooling water does not contact contaminants. The only effect on the cooling water is an increase in temperature as it is heated via contact with the plant, thus there is no need for toxicity testing; and

B). There is no practical way to control the non-contact cooling water flow. The pumps and piping is specifically designed and built to provide adequate cooling for a shipboard plant, without flow meters.

Black Water

Treated black water discharge depends on the size of the vessel and personnel on board (POB). A properly designed and certified marine sanitation device (MSD) is allowed to adequately treat waste for a specified number of POB.

Possible ranges of volumetric flow – Black water flow varies from zero (if the vessel has adequate storage for temporary holding) to the design discharge of the installed treatment system.

The most significant potential environmental effect of treated sewage discharges is residual chlorine used in the treatment process.

Gray Water

The amount of gray water discharge depends on the size of the vessel and the vessel's POB. Some vessels have the capability of processing gray water through the MSD and some vessels only have gray water piping that leads directly overboard.

Possible ranges of volumetric flow – Gray water flow varies from zero (if the vessel has adequate storage for temporary holding) to the total amount of gray water produced by vessel crew. This is highly dependent on the vessel POB and a number of factors (amount of laundry, cooking, showers, etc).

The potential environmental effect of gray water is dependent on what is discharged down the drains, usually water with residual soap.

Deck Drains

The amount of deck drain discharge depends on the size of the vessel and the vessel's activities. Some vessels have the capability of processing drain water through the oil water separator and other vessels only have deck drains leading directly overboard.

Possible ranges of volumetric flow – Deck drain flow varies from zero (if the vessel has adequate storage for temporary holding) to the amount of seawater, rain water, etc drained from the vessel's exterior decks.

The environmental effect of deck drains should be negligible as long as controls are in place to ensure they aren't used to dispose of inappropriate materials, as is already required in the vessel best management practices.

De-salination Discharge

The amount of de-salination discharge depends on the size of the vessel and POB. The larger the POB, the higher fresh water consumption rating, and a corresponding higher demand for fresh water.

Possible ranges of volumetric flow – De-salination flow varies from zero (on vessels with no water making capabilities) to the corresponding de-salination discharge from water makers. This amount will depend on the capacity of the water maker.

De-salination discharge is not typically monitored for the following reasons:

A). There is little to no environmental harm from de-salination discharge. De-salination discharge is simply seawater with a moderately greater salt concentration than seawater.

B). There is no practical way to control the de-salination discharge if a water maker is in use. Water makers are purposely designed to extract salt from the water to produce fresh and potable water.

Bilge Discharge

The amount of bilge water discharge depends on the size of the vessel and activities performed. Most vessels (except for smaller boats) have oily water separators that are designed to remove oil content from bilge water to 15 parts per million (PPM) or lower.

Possible ranges of volumetric flow – Bilge water varies from zero (if the vessel has adequate storage for temporary holding) to the amount of bilge water produced by the vessel operations.

With the exception of smaller craft, bilge processed through an oil water separator is monitored and recorded in an official oil record book.

The environmental effect of bilge discharge is generally negligible if oil water separators in the larger vessels (i.e. with correspondingly higher discharges) are used properly. Controls in the VGP already address this concern.

Ballast Water

The amount of ballast water discharge depends on the size of the vessel and activities performed.

Possible ranges of volumetric flow – Ballast water flow varies from zero (on vessels with no ballast system or if the ballast system isn't being utilized) to the discharge required to maintain proper vessel stability and trim.

The environmental effects of ballast water discharge are generally negligible since it usually consists of sea water. There is potential to introduce invasive micro organisms via ballast water from different climates. This can be mitigated via ballast water exchange at sea as required by a proper Ballast Management Plan. Also some vessels use freshwater as ballast instead of sea water.

Fire Water

Fire water discharge depends on the size of the vessel and the vessel's activities.

Possible ranges of volumetric flow – Fire water varies from zero to the amount of discharge required by the vessel's activities.

There is no environmental effect from fire water because the system simply pumps sea water local to the vessel and discharges it back to the sea via piping and hoses, and no chemicals are added to these systems.

Boiler Blow Down

Boiler blow down discharge depends on the size of the vessel and the boilers installed (if the vessel even uses a boiler - some vessels will not even have a boiler on board.).

Possible ranges of volumetric flow – Boiler blow down varies from zero (if the vessel doesn't have boilers or doesn't need to blow down the boilers) to the amount of blow down required for boiler maintenance [usually not a large amount (less than 100 gallons) and usually not often (less than once a month)].

The potential environmental effects from boiler blow down depends on the feed water treatment chemicals being used. In this instance, we recommend EPA regulate this consistent with the VGP, requiring the permittee to reduce the use of chemicals.